

# **Applying Landscape Principles to SMA and GMA Planning**

- GMA/SMA coordination
- Adjacent lands
- Protect ecological functions
- Opportunity areas

# **A landscape evaluation can provide a comprehensive method for:**

- determining whether ecosystem processes have been altered
- identifying the mechanism and geographic location of alteration
- determining viable restoration opportunities
- identifying planning measures to protect and restore landscape scale processes in appropriate areas

**The landscape approach focuses on understanding the changes to **ecosystem processes.....** not structural conditions at the site.**

Beechie & Bolton, 1999.

# For example:

## Wetlands are an expression of larger scale processes...

Processes



Wetland

Structure



Function



..such as wetland plants



# **A method for applying the landscape approach:**

1. Identify water flow patterns & processes
2. Determine where water flow processes have been or could be altered (sensitivity map)
3. Determine what regional problems have developed or could develop from alteration of these processes
4. Identify mechanisms to protect and/or restore these processes
5. Identify potential planning and restoration opportunities

# Step 1- Determine water flow patterns

- Develop a general cross-section showing water flow across the landscape
- Data layers: geology, topography, soils
- <http://www.ecy.wa.gov/programs/sea/SMA/data/index.html>

Home

Laws and Rules

State Guidance

Local Planning

**Data**

Forms

Contacts

Links

Department of Ecology

Shoreline Management

Ecology Home | SEA Program Home | Search | Feedback

**Data and information sources**

Internet mapping sites

Digital and printed maps

Air photos, satellite imagery, LiDAR

Reports

Literature reviews

Studies in progress

**Data applications**

Example SMP shoreline characterizations

SMP inventory and assessment guidance

Site assessments

Shoreline/watershed assessment models

NEW

 Tool for wetland planning

 Ecology Home | SEA Program Home | Shoreline Home

▲

7

# Principles of Wetland Planning

A Tool for Evaluating Wetland Projects

Through an interactive questionnaire, this tool can be used to evaluate how well a wetland project incorporates current ecological principles.

This is a draft tool that is still under development. Comments are appreciated and can be emailed from the "Comments" button at the top of each page.

About this tool...

[Introduction](#)



Go to the...

[Guidance](#)



Go directly to the

[Questionnaire](#)

[Questionnaire](#)

CIATED/step2.htm

[A Program Home](#) | [Comments](#)

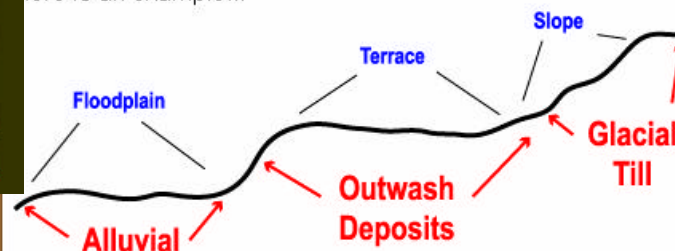
## Guidance

*Glaciated*

Step 2. Identify the Surficial Geology present in your landscape setting...

Task: Add **surficial geology** to the **landform** cross section from step 1.

Here is an example...

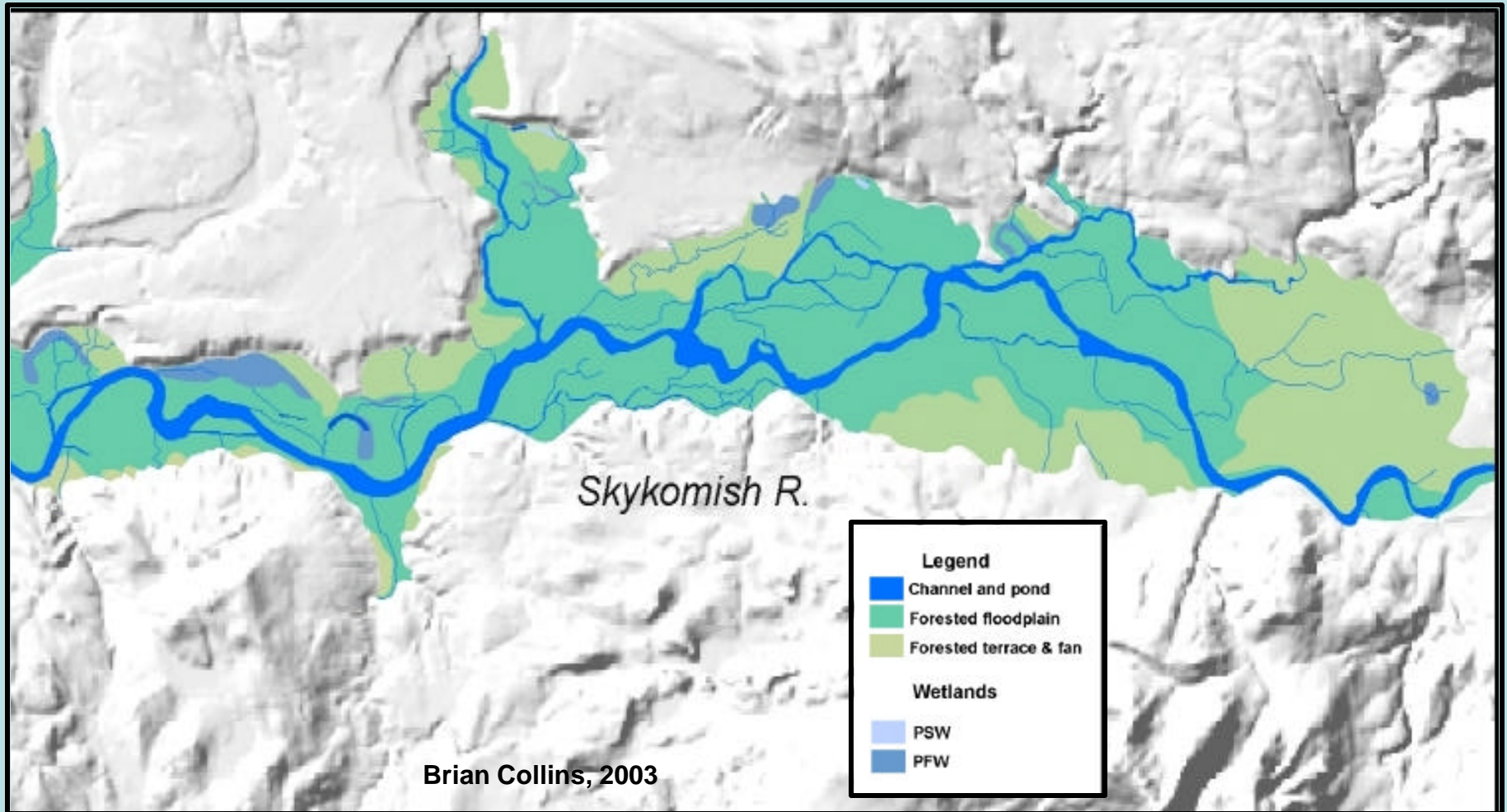


Purpose: Surficial geology is a major control of water movement and will help to determine the water flow patterns of the landscape in the next steps. The **County Soil Survey** will be needed to complete steps 2 and 3.

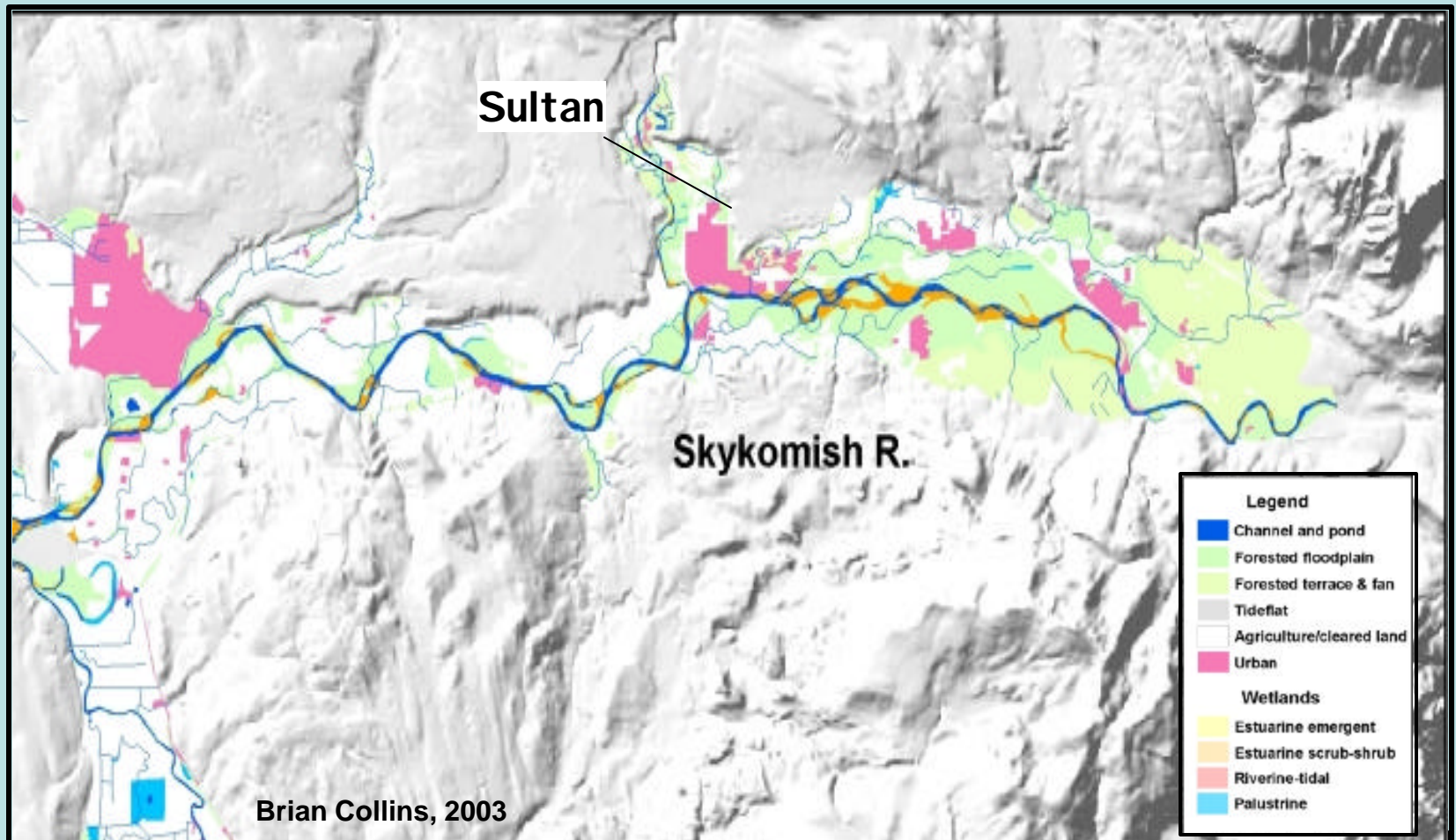
[Help](#)

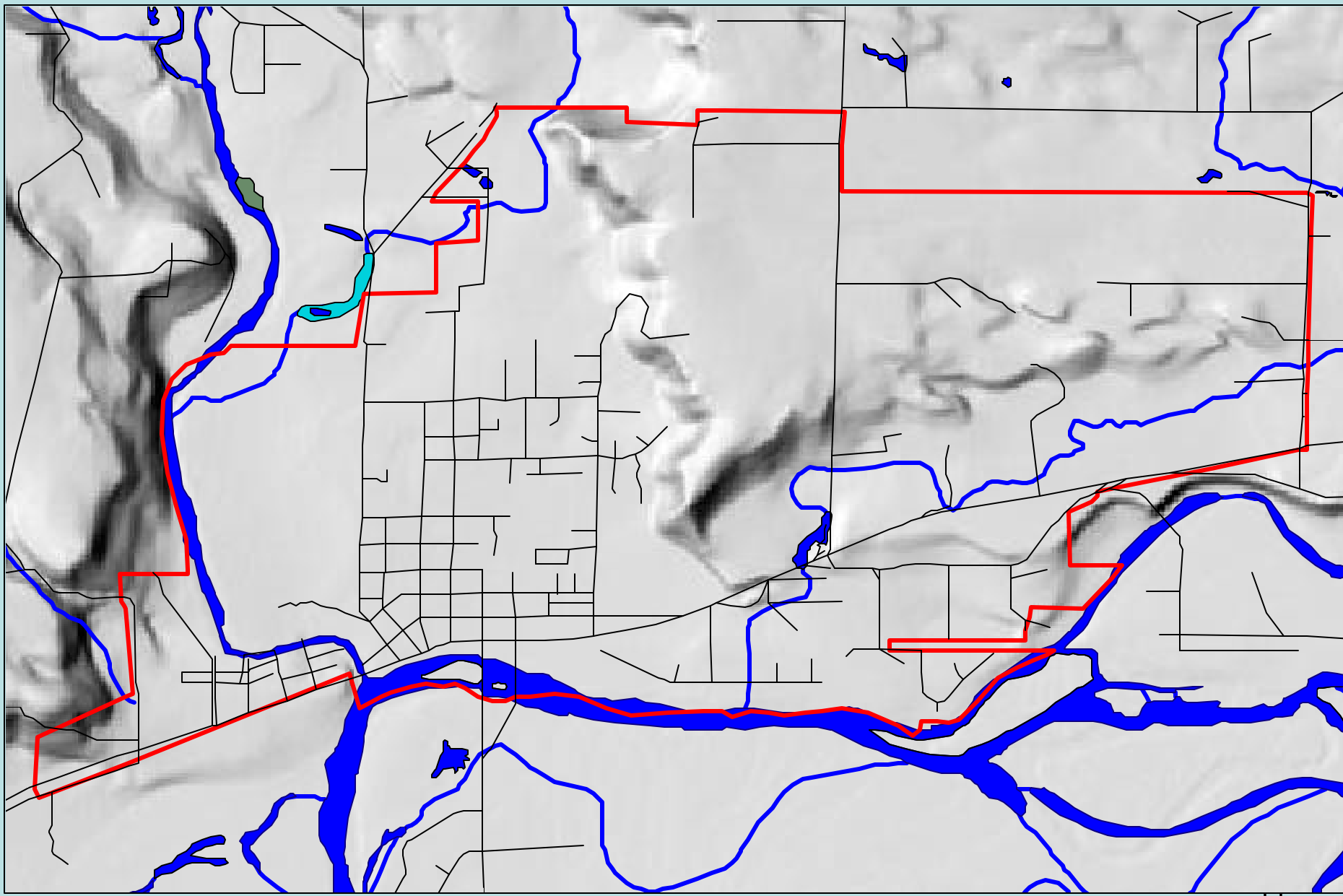
[Continue to Soil Properties](#)

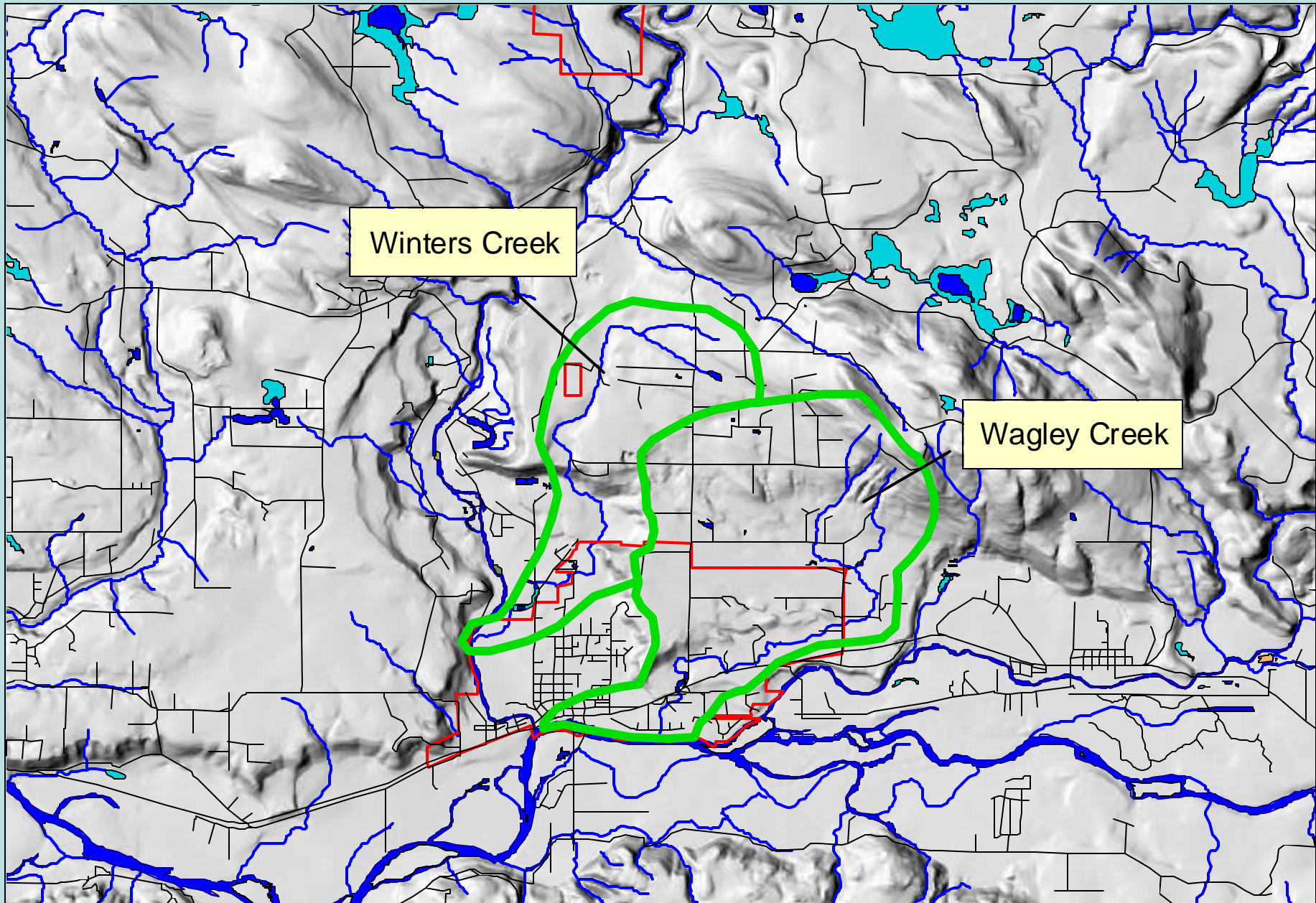
# Lower Skykomish Circa 1870



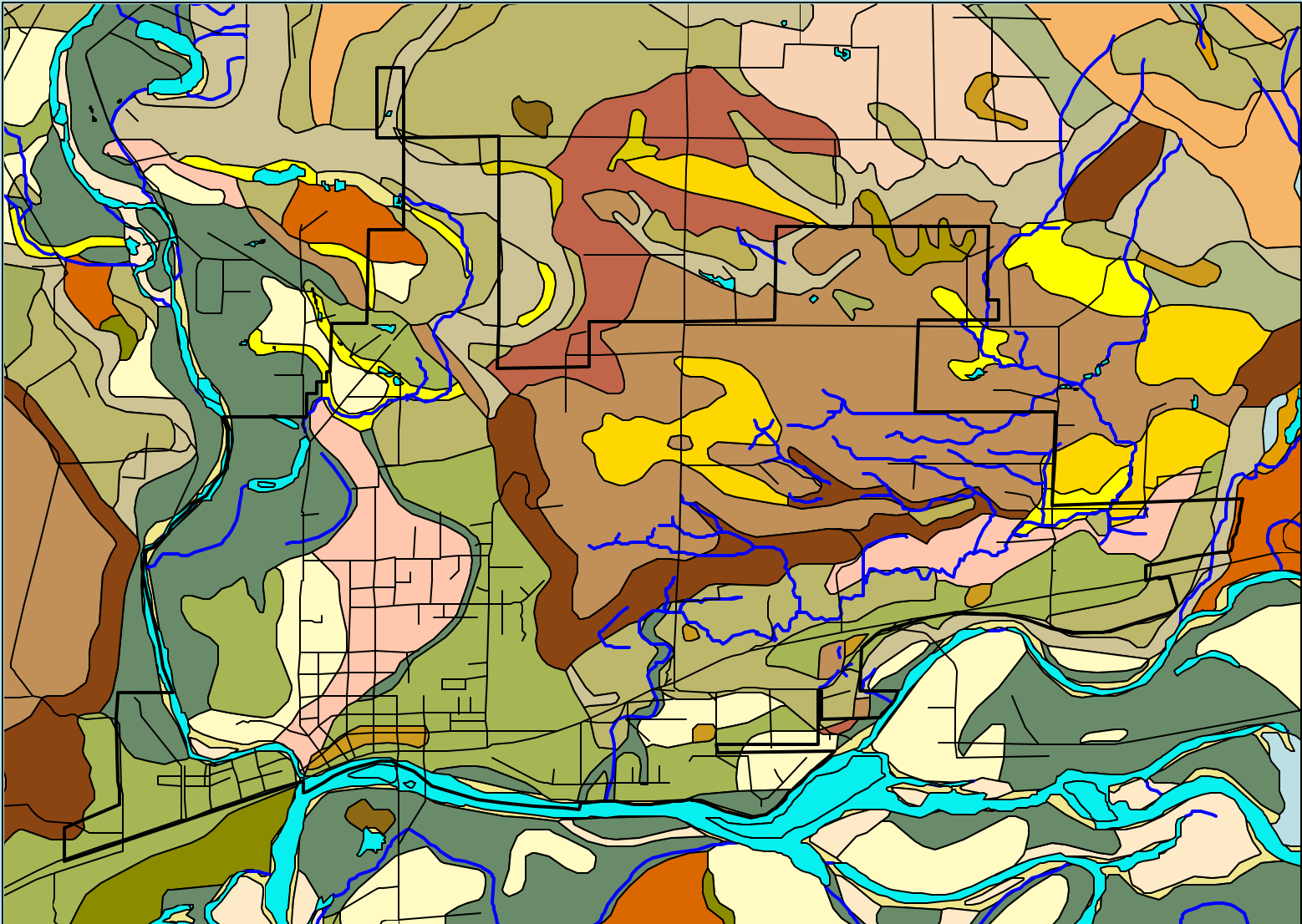
# Lower Skykomish Circa 2000



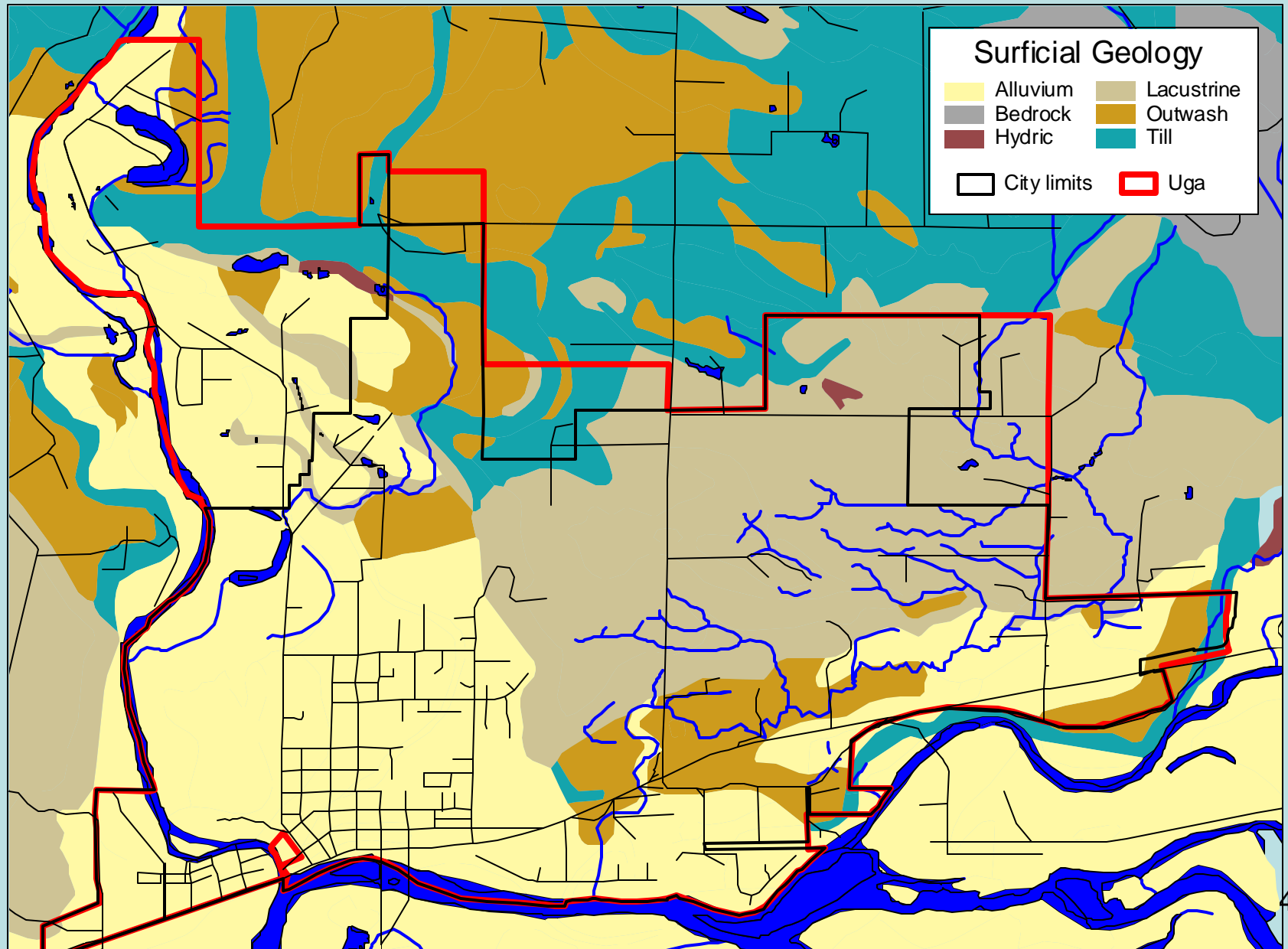




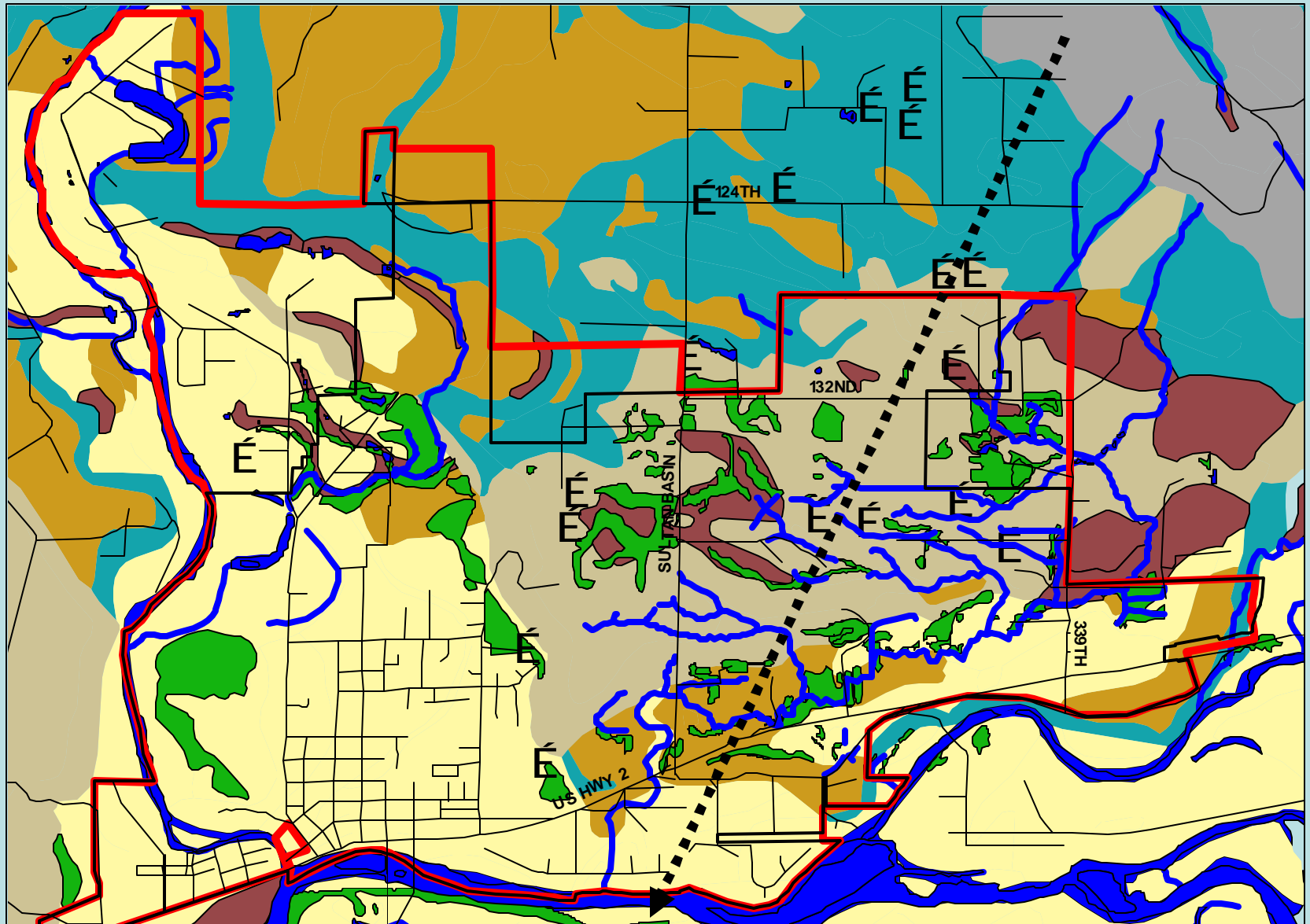
# Soil Types



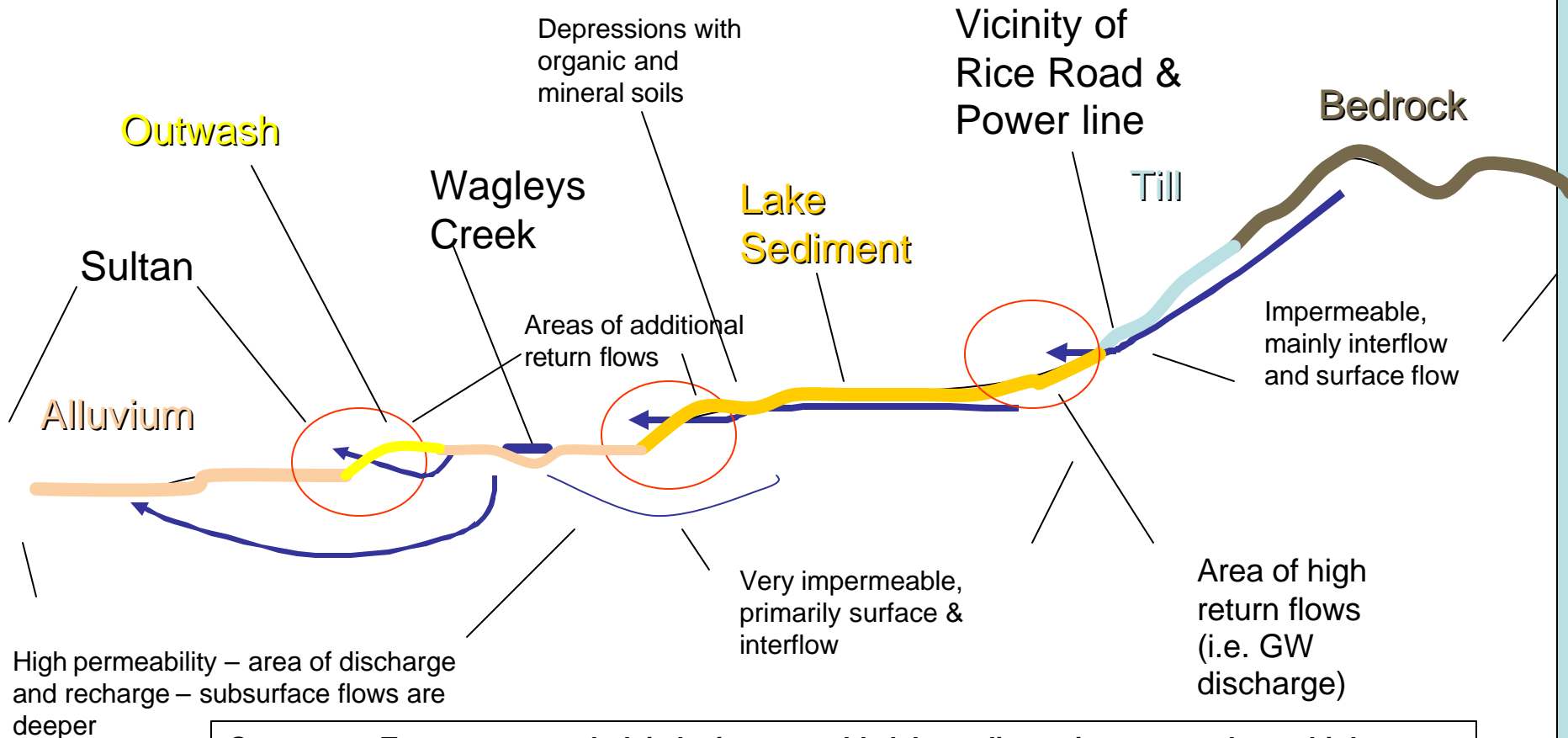
# Surficial Geology



# Wagley Creek Cross Section Line

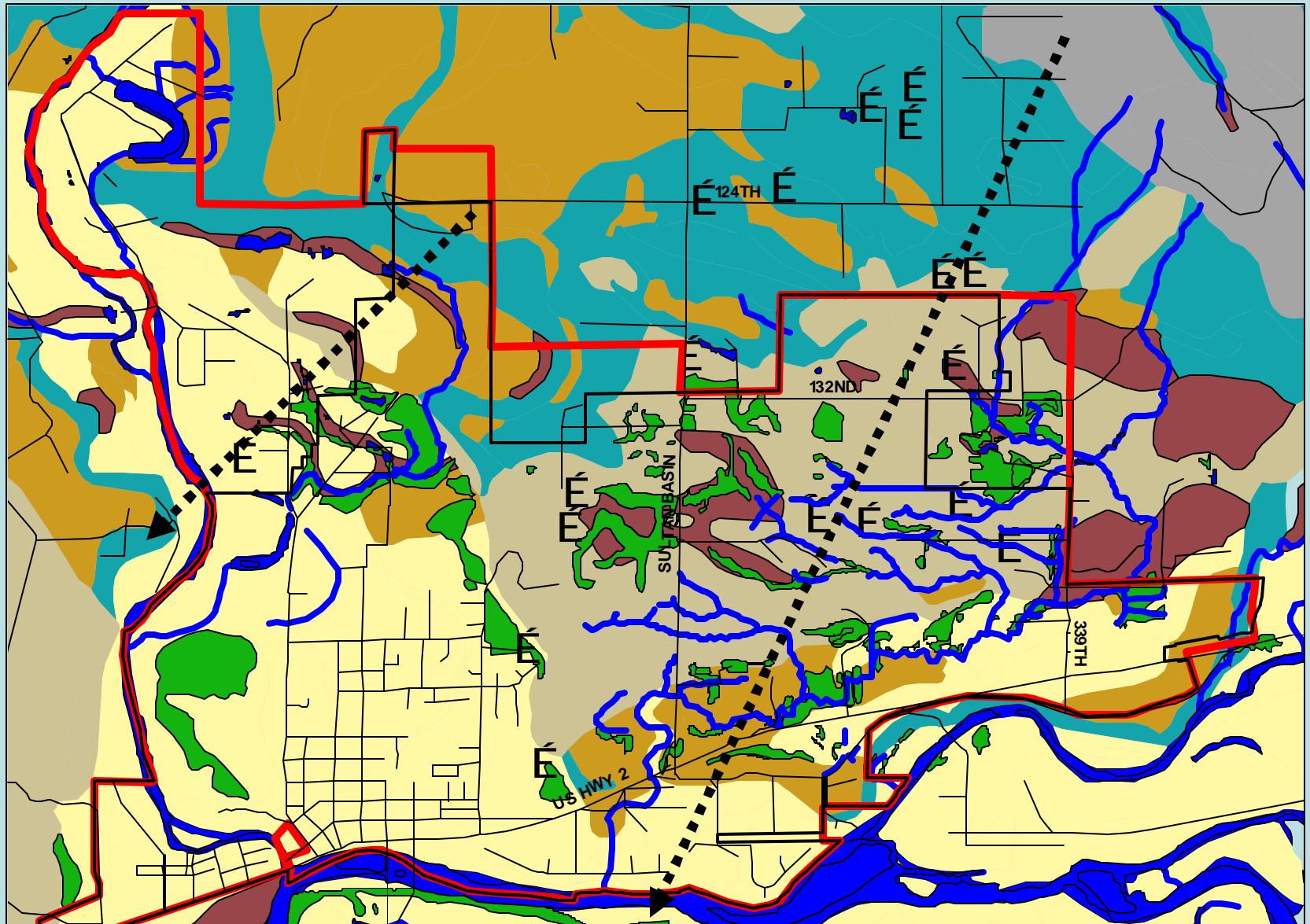


# Wagley Creek Cross-section

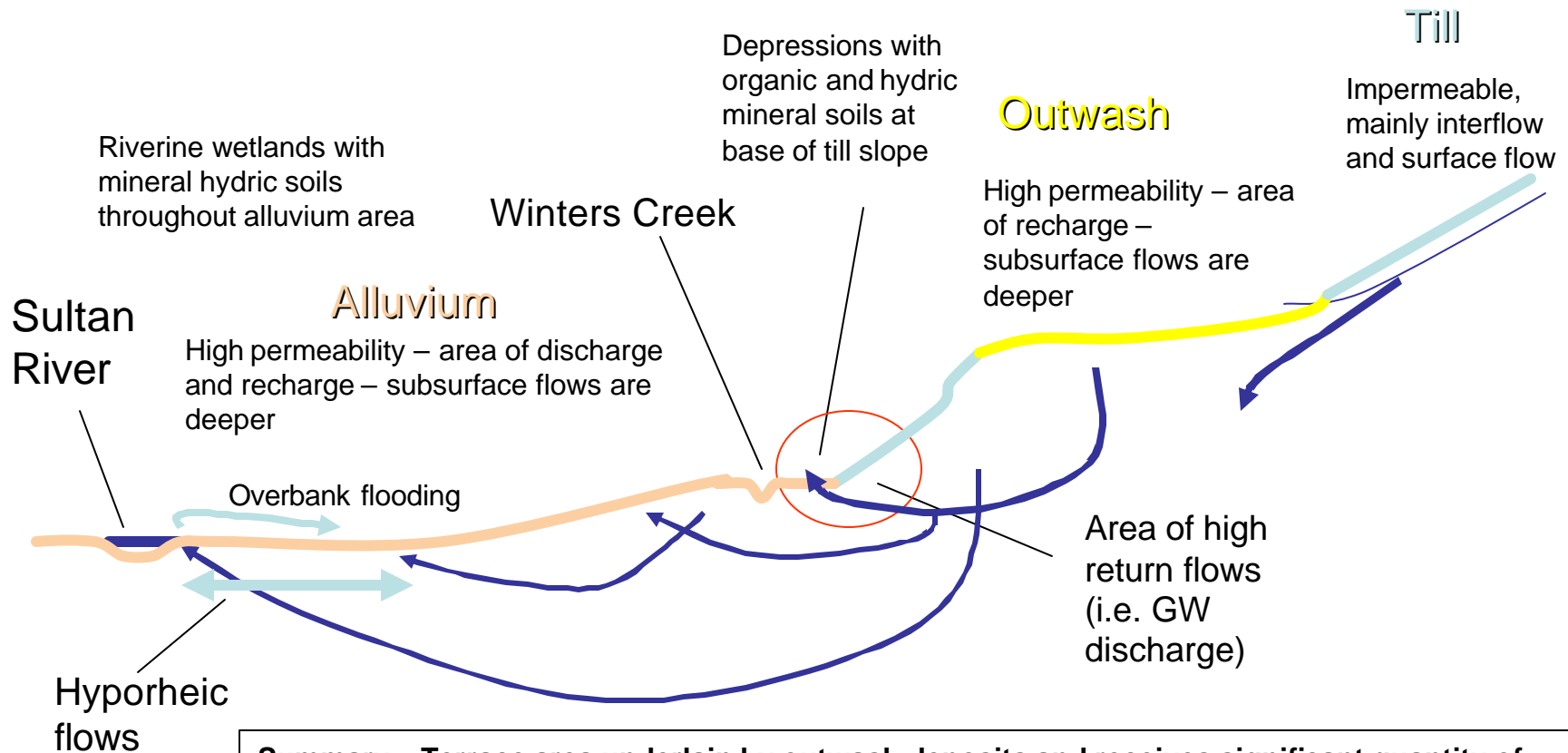


**Summary – Terrace area underlain by impermeable lake sediment is very wet due to high return flows upstream. Most of this water discharges as shallow interflow & surface flow to Wagleys Creek (at slope break above Wagleys Creek terrace). Lake sediment terrace has high potential for supporting existing wetlands and for expanding wetland areas. These water flow processes support the hydrology of existing wetlands and the hydrology of Wagleys Creek and the Skykomish River and should be protected, and where possible restored.**

# Winters Creek Cross Section Line



# Winters Creek Cross-Section

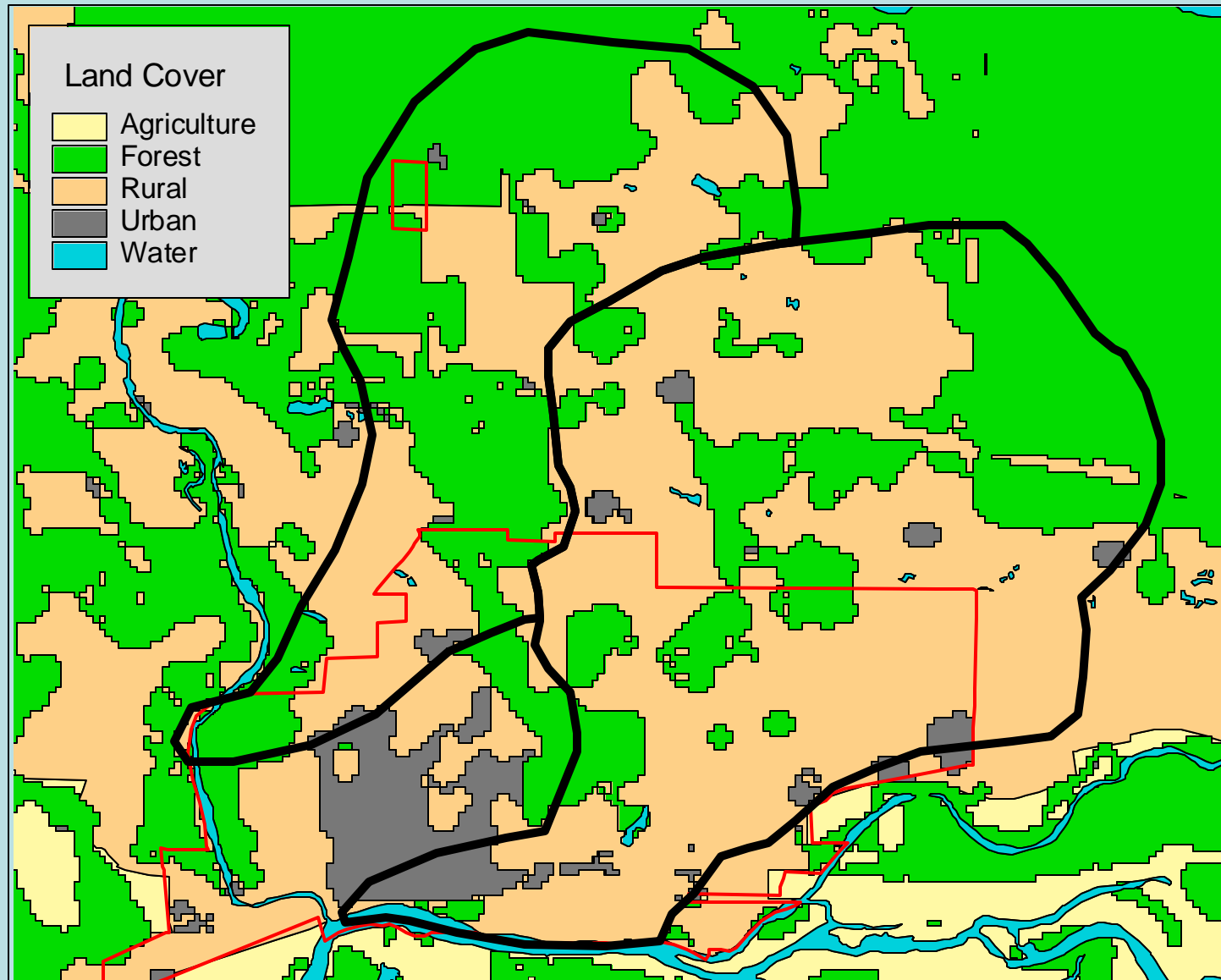


**Summary –** Terrace area underlain by outwash deposits and receives significant quantity of interflow and surface flows from till slopes. Some discharge may occur at till outwash interface but most subsurface flows are deeper for the outwash terrace; this is an area of recharge which provides important subsurface flows (i.e. via groundwater discharge) to Winters Creek and Sultan River and associated wetlands. Overbank flooding and hyporheic flows are also significant processes in the floodplain areas. These water flow processes support the hydrology of existing wetlands and rivers/creeks and should be protected, and where possible restored.

## Step 2 – Determine where water flow processes have been or could be altered

- 65% forest
- 10% impervious surface

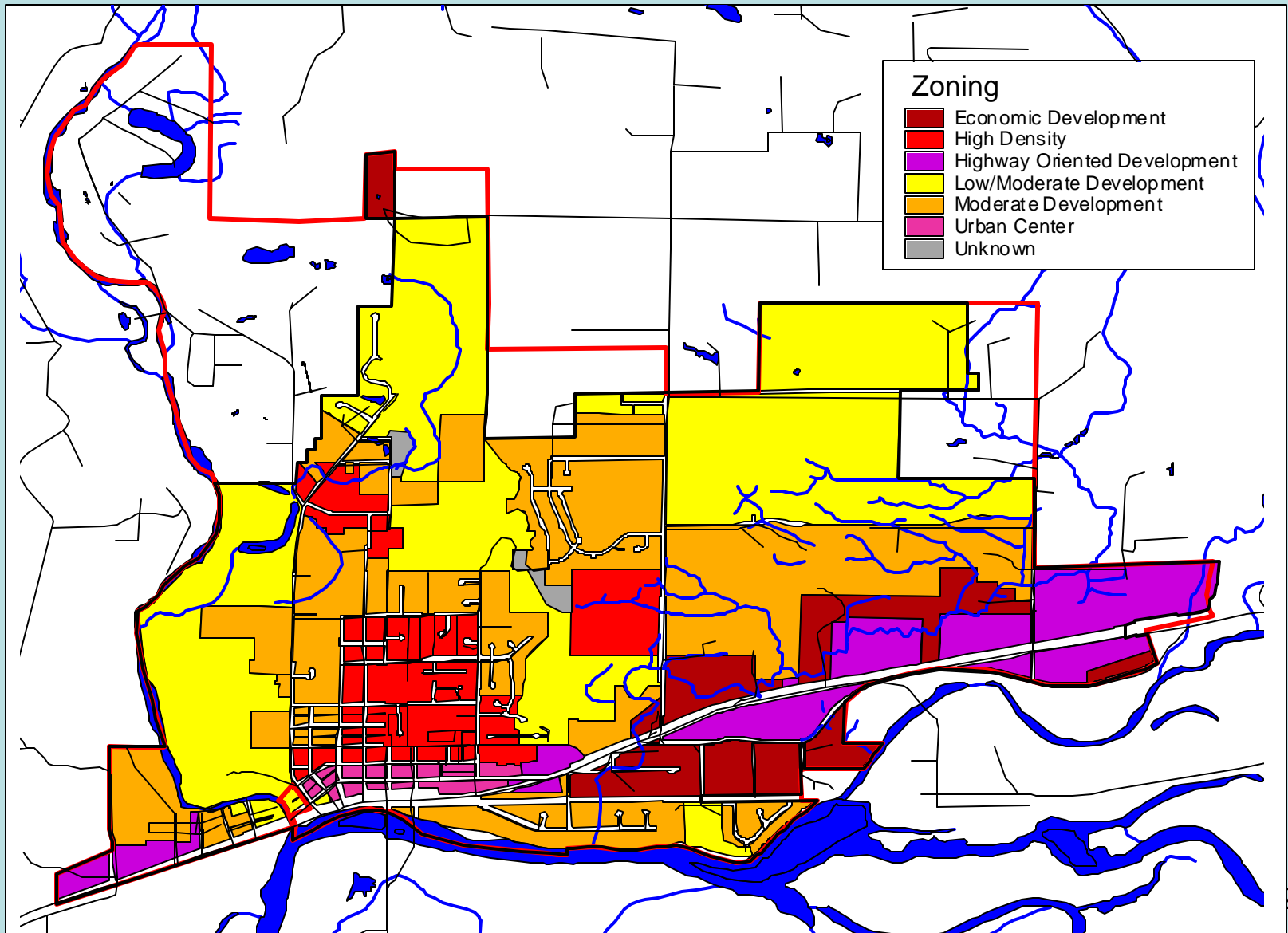
# Land Cover



# Sub-Basin Land Use Alteration

	Winters Creek (1153 acres)	Wagley Creek (2054 acres)
Forest	617 53%	596 29%
Ag	0	0
Rural	514 46%	1356 66%
Urban	17 1%	82 4%

# Land Use map



# Percent Runoff by Soil Type

**Table II– Soil Groups and Percent Runoff for Wagley and Winters Creek**

Soil Types with Greatest Coverage	Hydro Group	Runoff Level Based on Hydro Group (from NRCS TR 55)		
		Residential	Pasture	Woods
Lacustrine				
Pastik	D			
Outwash				
Everett	A			
Till				
Tokul	C			

# Percent Runoff by Soil Type

**Table II– Soil Groups and Percent Runoff for Wagley and Winters Creek**

Soil Types with Greatest Coverage	Hydro Group	Runoff Level Based on Hydro Group (from NRCS TR 55)		
		Residential	Pasture	Woods
Lacustrine				
Pastik	D	87		
Outwash				
Everett	A	61		
Till				
Tokul	C	83		

# Percent Runoff by Soil Type

**Table II– Soil Groups and Percent Runoff for Wagley and Winters Creek**

Soil Types with Greatest Coverage	Hydro Group	Runoff Level Based on Hydro Group (from NRCS TR 55)		
		Residential	Pasture	Woods
Lacustrine				
Pastik	D	87	80	
Outwash				
Everett	A	61	39	
Till				
Tokul	C	83	74	

# Percent Runoff by Soil Type

**Table II– Soil Groups and Percent Runoff for Wagley and Winters Creek**

Soil Types with Greatest Coverage	Hydro Group	Runoff Level Based on Hydro Group (from NRCS TR 55)		
		Residential	Pasture	Woods
Lacustrine				
Pastik	D	87	80	77
Outwash				
Everett	A	61	39	30
Till				
Tokul	C	83	74	70

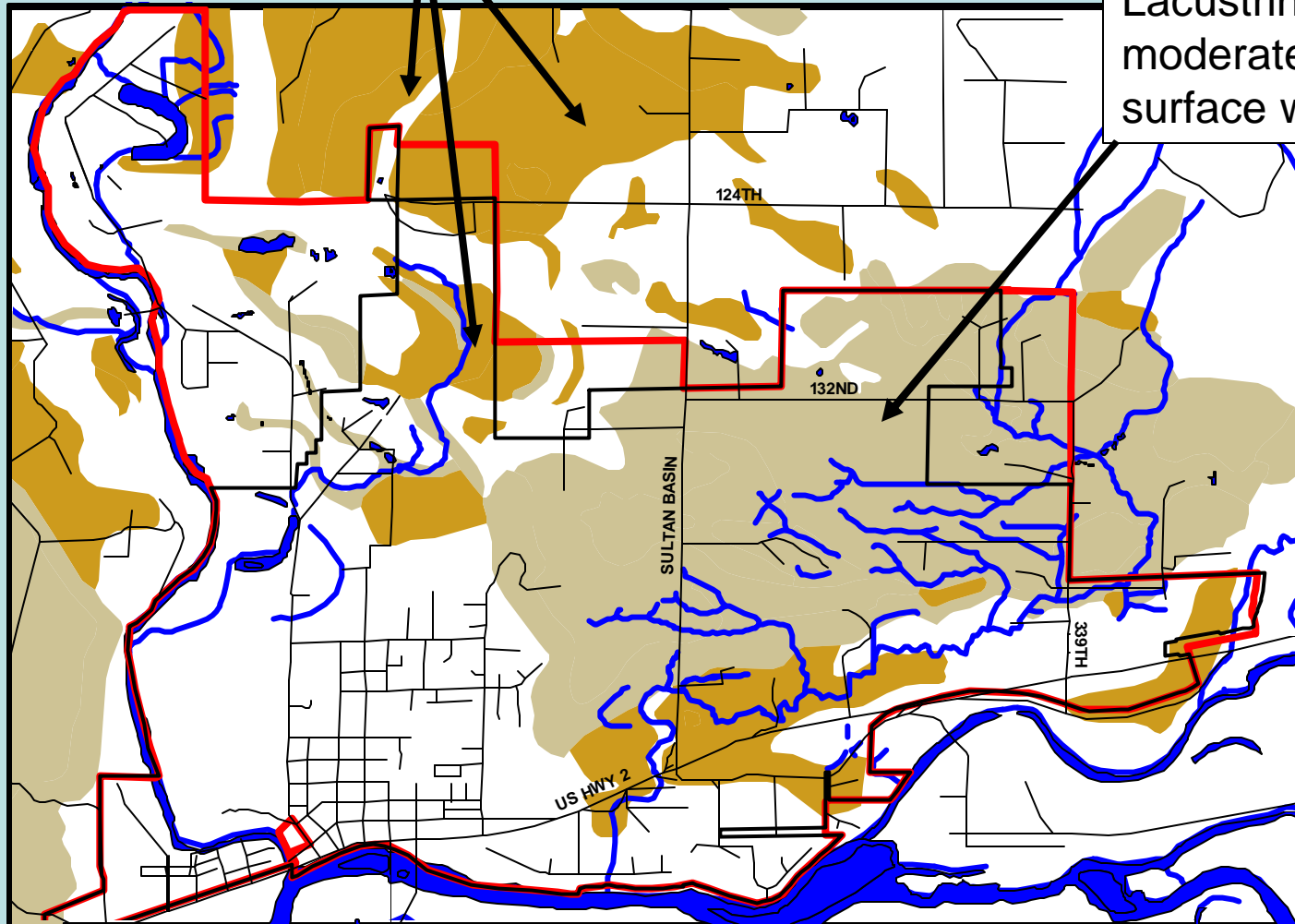
# Soil Characteristics

Table II– Soil Permeability for Wagley and Winters Creek			
Soil Types with Greatest Coverage	Hydro Group	Soil Characteristics	
		Permeability	Seasonal Water Table
Pastik (Lacustrine)	D	Very Low	High
Everett (Outwash)	A	Very High	None
Tokul (Till)	C	Low (Cemented Hardpan)	High

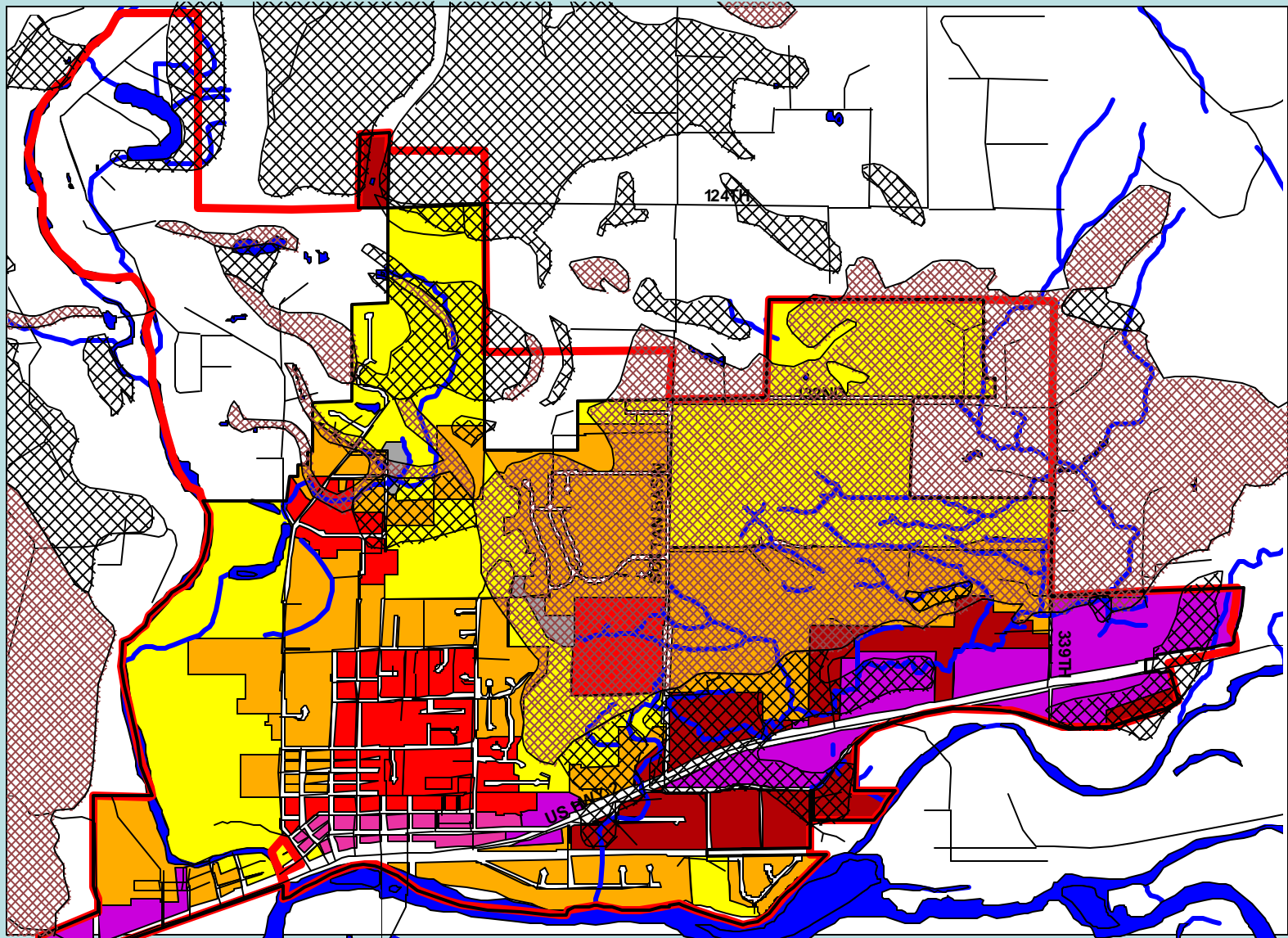
# Areas Sensitive to Alterations

Outwash deposits –  
high importance for  
ground water  
recharge

Lacustrine formation –  
moderate to high  
surface water runoff



# Sensitive Areas and Land Use



# Summary of Sensitivity to Alteration for **Wagley** Creek

- Lacustrine terrace soils located in upper watershed have limited storage capacity
- **Wetlands and stream network** play major role in maintaining water flow processes
- Drained wetlands, including seasonally wet areas, should be considered a priority for restoration

# Summary of Sensitivity to Alteration for **Winters** Creek

- Outwash terrace in upper watershed is a **recharge area**
- These soils and deposits have significant storage capacity for subsurface waters

# Step 3 – Existing and potential regional problems

- Habitat fragmentation
- Loss of historic wetlands
- Potential reduction of existing forest cover
- Lacustrine
  - High runoff potential
  - Has significant effect on downstream processes
- Outwash
  - Recharge area
  - Has significant effect on downstream processes

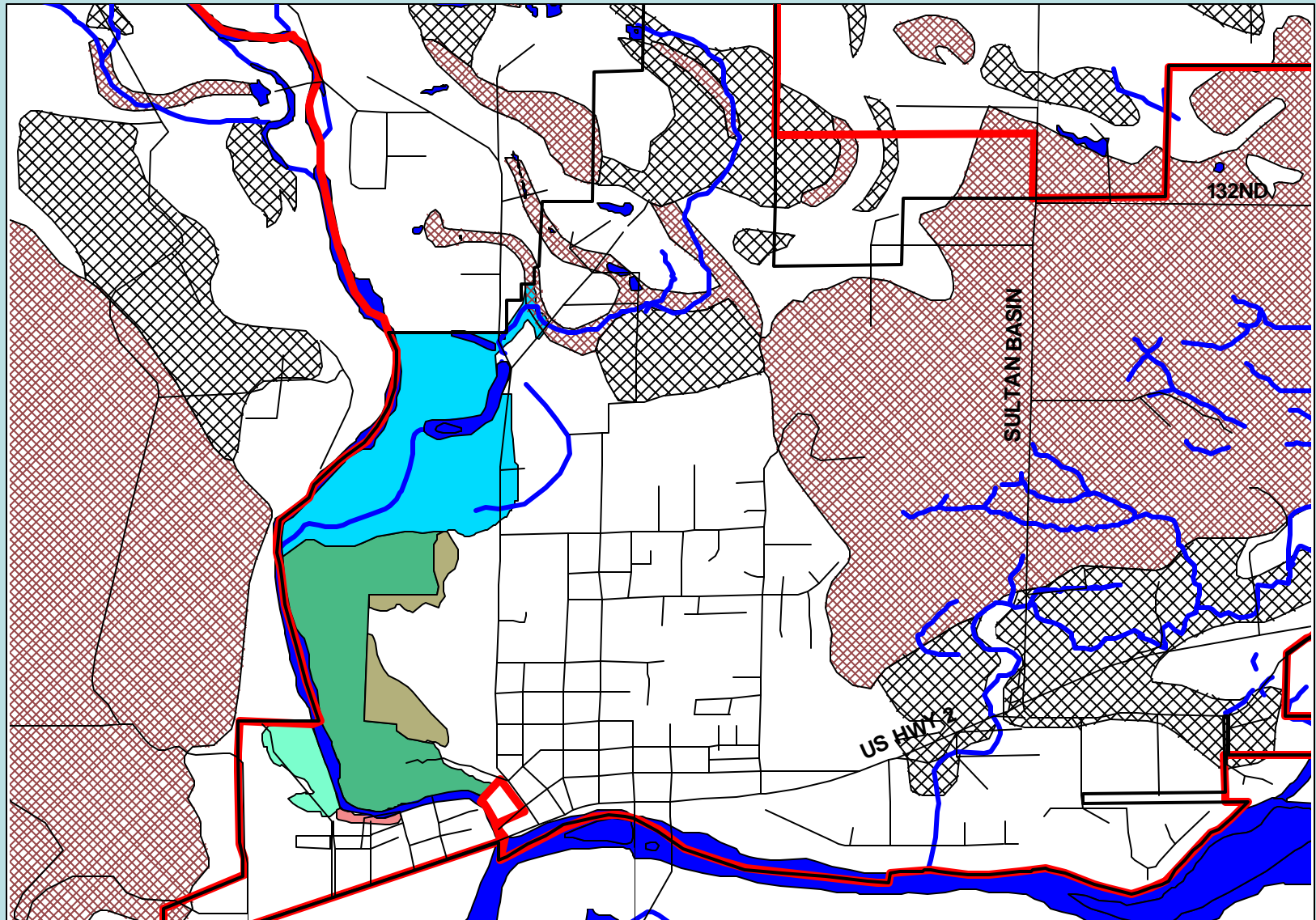
# Step 4 - Mechanisms to protect or restore

- Lacustrine Terrace
  - Need to **increase residence time of water flow** (storage capacity of soils is low and area for development is large)
- Outwash Terrace
  - Need to **allow infiltration of surface and subsurface water** by not creating large areas of impermeable surface

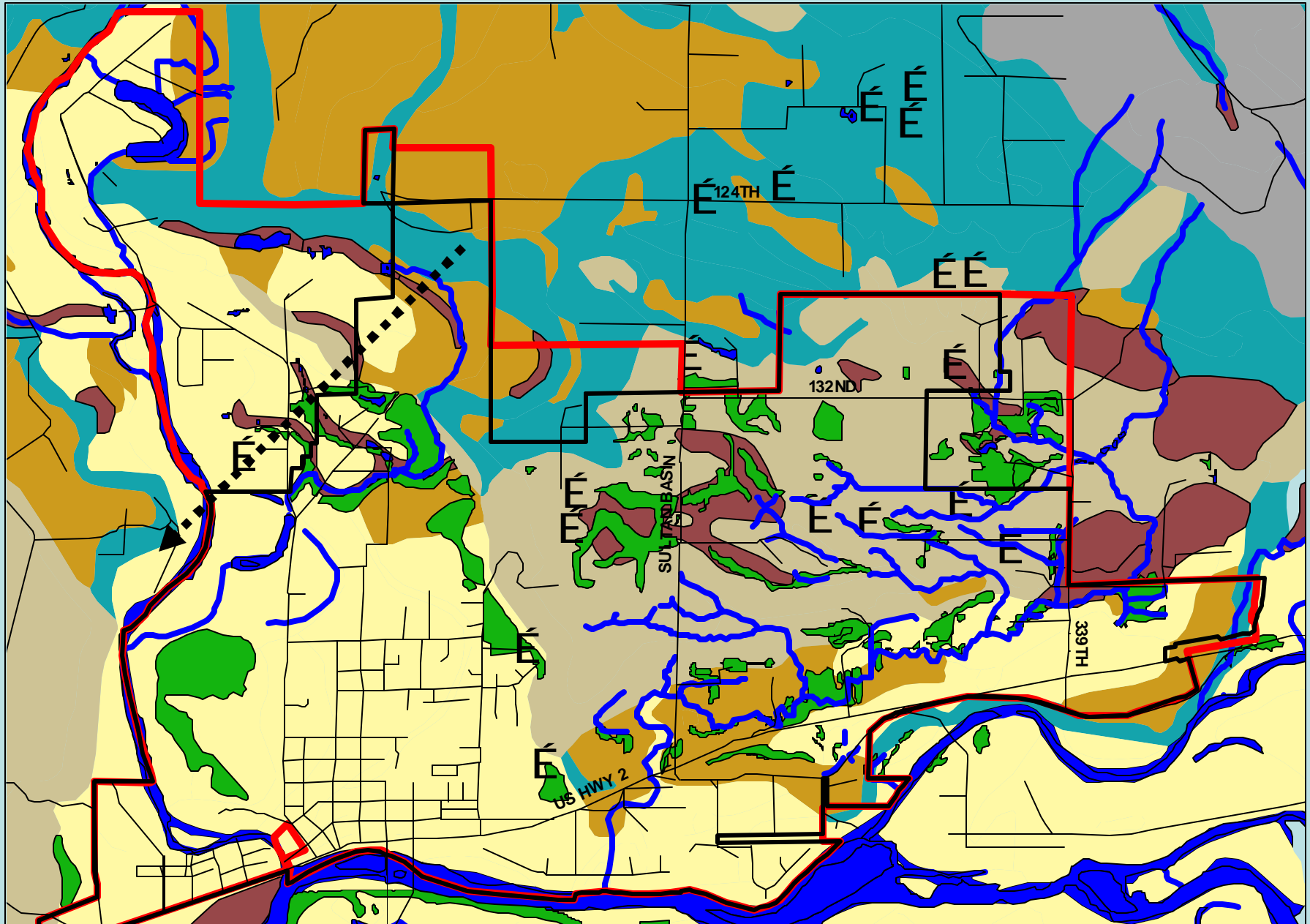
# Step 5 – Identify potential planning and restoration opportunities

- Outwash -
  - Low intensity development to continue infiltration processes
- Lacustrine –
  - Restoration of drained wetlands
  - Low impact development; cluster development & maintain and/or restore tree cover surrounding development
  - Maintain stream & wetland network
  - Ensure that surface water runoff is not channelized, piped or discharged in point sources

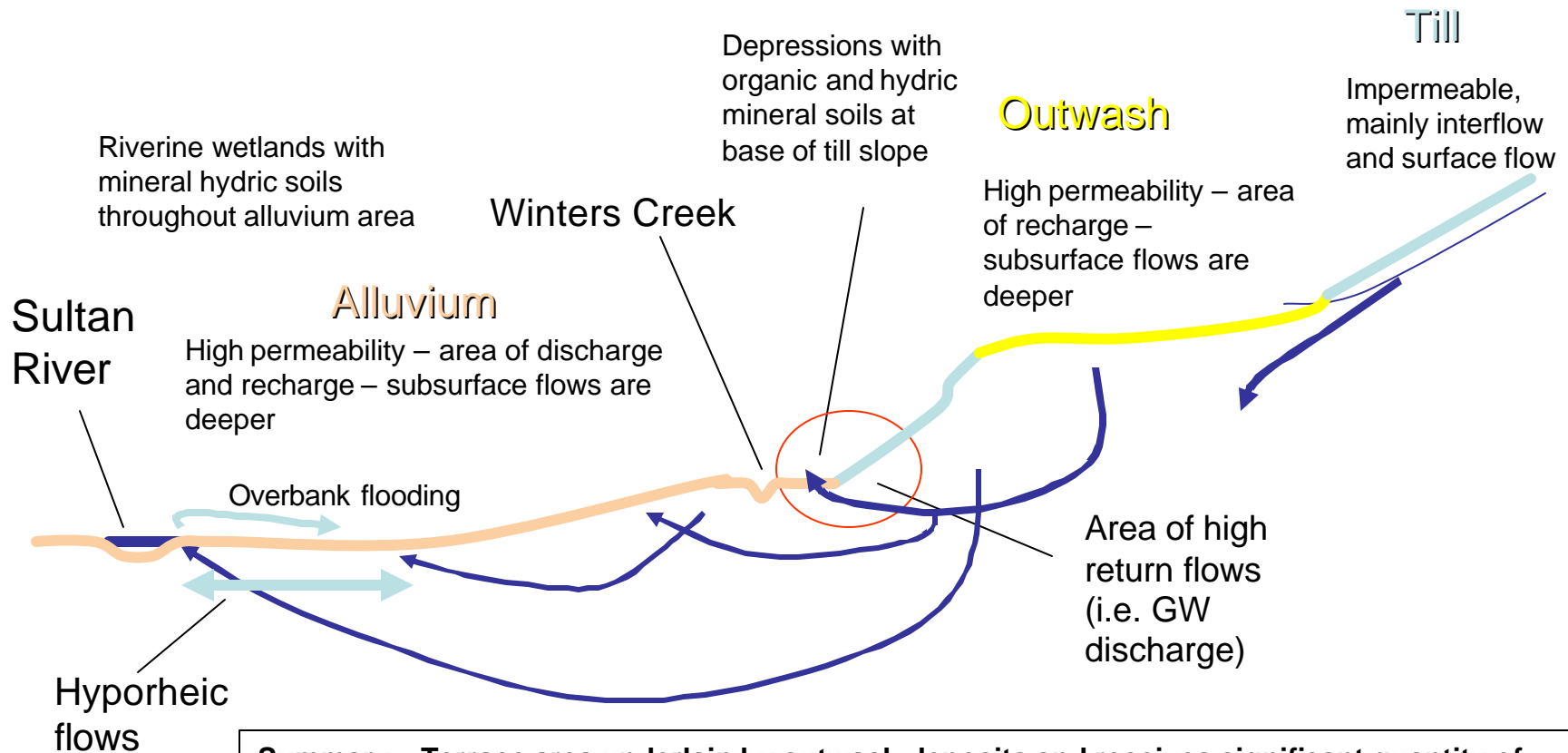
# Opportunity Areas – Sultan Shoreline Inventory



# Winters Creek Cross Section



# Winters Creek Cross-Section



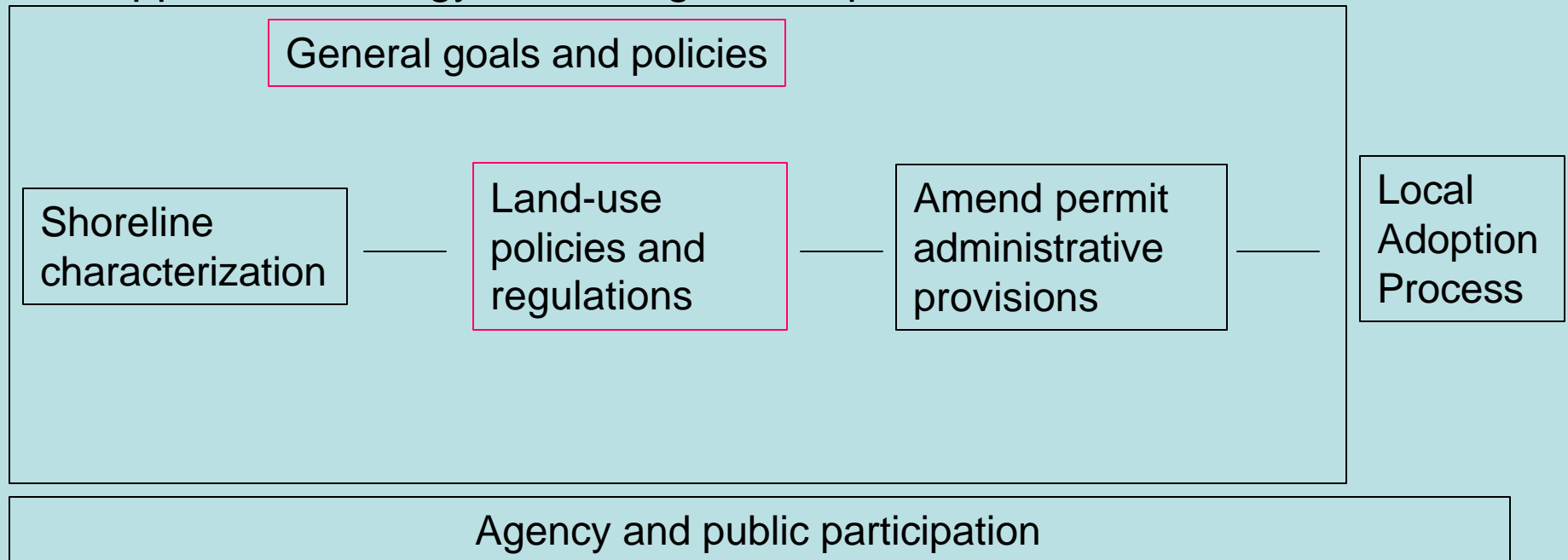
**Summary –** Terrace area underlain by outwash deposits and receives significant quantity of interflow and surface flows from till slopes. Some discharge may occur at till outwash interface but most subsurface flows are deeper for the outwash terrace; this is an area of recharge which provides important subsurface flows (i.e. via groundwater discharge) to Winters Creek and Sultan River and associated wetlands. Overbank flooding and hyporheic flows are also significant processes in the floodplain areas. These water flow processes support the hydrology of existing wetlands and rivers/creeks and should be protected, and where possible restored.

# Summary

- Landscape scale approach:
  - Provides information necessary to assess the ecological functions
  - Ensure the long term protection of critical resources and functions (no net loss)
  - Identifies best areas and approaches for restoration

# City of Sultan SMP update- moving forward:

- Ecology reviewed draft characterization report.
- Report available for public review.
- Incorporated comments into final report.
- Presented report, maps, and recommended environment designations to planning commission for review.
- Applied to Ecology for CZM grant for phase 2.



Home

Laws and Rules

State Guidance

Local Planning

Data

Forms

Contacts

Links

[Ecology Home](#) | [SEA Program Home](#) | [Search](#) | [Feedback](#)

## Shoreline Management Act home page

Washington's Shoreline Management Act (SMA) was adopted by the public in a 1972 referendum "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines."

The SMA establishes a balance of authority between local and state government. [Cities and counties](#) are the primary regulators. Ecology provides technical assistance, and reviews local programs and permit decisions. The Act places a strong emphasis on public involvement in developing local shoreline programs and provides opportunities for public input into individual permits.

## News and Announcements

Ecology has released draft [shoreline master program guidelines](#) resulting from a negotiated settlement. Parties to the mediation are promoting **legislation** to change implementation deadlines, and seeking **state funding**.

Washington's new [Digital Coastal Atlas](#) is an interactive map server that allows you to access and analyze geospatial data for Washington's coastal region.

